We claim:

1. A method of characterizing a display having an arbitrary monotonic transfer function, comprising:

    a. generating an inverse of an approximating spline through control points using the steps of:

        1. providing at least two known control points;

        2. fitting a spline through existing control points;

        3. creating a test point candidate list from combinations of the control points;

        4. selecting a test point from the test point candidate list;

        5. generating a visual test pattern with the test point's parents;

        6. performing a visual comparison at the selected test point by adjusting the display input value of the test point until a perceptual match is made;

        7. accepting an adjusted test point as a new control point;

        8. repeating steps 2 through 7 for further refinement of the approximating spline;

2. The method of claim 1 wherein the initial display input value of step 6 is estimated by interpolating the value of the approximating spline at the test input value.

3. The method of claim 1 wherein the adjustable range of the display input value of the test point in step 6 has a lower limit of the display input value of the control point whose test input value is closest to the test input value of the test point without being greater than the test input value of the test point, and has an upper limit of the display input value of the control point whose test input value is closest to the test input value of the test point without being less than the test input value of the test point.

4. The method of claim 1 wherein a user selects a test point candidate from the test point candidate list.

5. The method of claim 1 wherein test point candidates are culled from the test point candidate list to reduce the number of test point candidates.

6. The method of claim 1 wherein, when two test point candidates coincide, the test point candidate with the parents furthest apart is chosen.

7. The method of claim 1 wherein a test point candidates may only be selected from a pre-determined test point candidate list.

8. The method of claim 1 wherein a sequence of test points is pre-determined.

9. The method of claim 1 wherein the steps are repeated for each of the color channels of the display device.

10. The method of claim 9 wherein the color channels of the display device are red, green and blue.

11. The method of claim 1 wherein the characterizing is performed simultaneously for all of the color channels of the display device by:
      a. adjusting the luminance level and chrominance values; and
      b. converting these values to changes in each color channel.

12. The method of claim 11 wherein the color channels of the display device are red, green and blue color channels.

13. The method of claim 1 wherein one of first control points corresponds to the darkest display input value.

14. The method of claim 1 wherein one of first control points corresponds to the lightest display input value.

15. The method of claim 1 wherein two of first control points correspond to the darkest display input value and the lightest display input value.

16. The method of claim 1 wherein the candidate test point list is created from combinations of control points whose test input values have been have been quantized to realizable discrete values and the display input values of the control points corresponding to these discrete values have been interpolated along the approximating spline.

17. The method of claim 1 wherein, in step 6, the comparison of the test point is made using a hardware device capable of relative comparisons.